INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 15, Issue 2, (2025) E-ISSN: 2222-6990

Unveiling the Dynamics of Psychological Capital in the JD-R Theory: A Systematic Review of Moderation and Mediation Effects

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To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v15-i2/24893 DOI:10.6007/IJARBSS/v15-i2/24893

Published Date: 27 February 2025

Abstract

This study examines psychological capital's role within the Job Demands-Resources (JD-R) theory, specifically as a moderating and mediating factor. Psychological capital, representing positive psychological states, has been linked to job satisfaction and employee well-being, yet its potential mediation and moderation roles within JD-R have received limited systematic investigation. This review followed PRISMA guidelines, focusing on quantitative, peer-reviewed articles published between 2001 and June 2024 that explored psychological capital as a mediator or moderator in JD-R frameworks. Searches were conducted in Web of Science and Scopus, yielding 35 studies across diverse countries and industries, utilizing cross-sectional, longitudinal, and diary study designs. Quality appraisal via the Joanna Briggs Institute (JBI) tools classified most studies as "high" quality, though some had issues with sample criteria and confounding factors. Findings highlight psychological capital's frequent role as a mediator, with variability in strength, direction, and statistical significance. Its role as a moderator appears diverse and complex, reflecting a nuanced impact across different contexts. Limitations include inconsistencies in measurement tools and study designs, underlining the need for more standardized approaches to refine future research in JD-R and psychological capital dynamics.

Keywords: Psychological Capital, Systematic Literature Review, Job Demands-Resources Theory, Mediating Role, Moderating Role, Well-Being

Introduction

Globalization and technological advancements have significantly impacted the work environment, resulting in increased pressure and challenges for employees (Rabenu, 2021).

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With these changes, employee physical and mental health, along with job satisfaction, have become critical indicators of organizational success. As organizations face increasing pressures to maintain productivity while safeguarding employee well-being, understanding the psychological mechanisms at play has never been more crucial. This is where the Job Demands-Resources (JD-R) theory plays a pivotal role (Demerouti et al., 2001).

The JD-R theory introduces a dualistic model, positing that work-related demands and resources significantly influence employee well-being and performance (Bakker & Demerouti, 2007). Job demands refer to the physical, social, or organizational elements of a job that necessitate a sustained effort, whether mental or physical, often incurring specific physiological and psychological costs (Demerouti et al., 2001). On the flip side, job resources are characterized by the physical, psychological, social, or organizational factors that not only boost motivation but also facilitate the achievement of work-related goals, moderate the effects of job demands, and foster opportunities for learning and personal development (Bakker & Demerouti, 2017). This dual-path framework of the JD-R theory suggests that while high job demands can lead to stress and health issues (health impairment process), plentiful resources can enhance motivation and productivity (motivational process) (Schaufeli & Taris, 2014).

Given its comprehensive approach, the JD-R theory has become a cornerstone in understanding the link between job characteristics and employee well-being. The model's influence is reflected in its widespread application across occupational health and positive psychology research (Galanakis & Tsitouri, 2022). A key strength of the JD-R theory is its capacity to identify how certain resources, such as autonomy, social support, and constructive feedback, buffer the negative impacts of job demands, reducing burnout and improving performance (Bakker & Demerouti, 2014).

Within this framework, psychological capital (PsyCap) has become an essential personal resource. PsyCap refers to an individual's positive psychological state, encompassing resilience, optimism, hope, and self-efficacy, which collectively enable individuals to meet challenges and excel in their roles (Luthans et al., 2007). PsyCap has garnered increasing attention for its role in enhancing job satisfaction, reducing stress, and boosting overall job performance (Avey et al., 2010). Notably, research suggests that higher levels of PsyCap are associated with greater job satisfaction and improved individual and organizational outcomes (Vilariño del Castillo & Lopez-Zafra, 2022). As such, understanding PsyCap's role in organizational settings is imperative for enhancing employee performance and well-being.

However, despite its recognized value, the complexities of PsyCap's role as both a mediator and moderator in the JD-R framework remain underexplored. As a mediator, PsyCap can explain how job resources improve employee engagement and performance by fostering a positive psychological state (Xanthopoulou et al., 2007). As a moderator, PsyCap acts as a protective shield, mitigating the negative effects of job demands and reducing burnout (Bakker et al., 2023; Bakker & Demerouti, 2017). This dual role underscores PsyCap’s potential to foster both individual resilience and organizational effectiveness.

The significance of this study lies in its potential to expand our understanding of how PsyCap influences the relationship between job demands, job resources, and employee

outcomes within the JD-R framework. Despite its growing importance, the role of personal resources such as PsyCap has not been fully integrated into the JD-R theory, and there remains a need for further research to refine how these resources can be optimally leveraged in organizational settings (Galanakis & Tsitouri, 2022). And Goswami and Goswami (2023) also recommended that upcoming studies delve deeper into PsyCap's role as both a mediator and moderator concerning different organizational factors and urged for more comprehensive literature reviews to better grasp the complexities of PsyCap.

This systematic review aims to synthesize quantitative evidence on the role of PsyCap in the JD-R theory, with a particular focus on how PsyCap mediates or moderates the effects of job demands and resources on employee well-being and performance. By clarifying the mechanisms through which PsyCap influences these relationships, this study will offer valuable insights for organizations seeking to optimize both individual and organizational performance. The findings will contribute to the development of effective interventions aimed at improving employee health, productivity, and overall organizational resilience.

Methods

To address the study issues mentioned, a systematic literature review approach was utilized. This study followed the reporting checklist of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA; Page et al., 2021) to ensure transparency, repeatability, and scientific rigour. Consequently, this led to the establishment of clear protocols for the search strategy, criteria for selection, data extraction, and subsequent data analysis.

Eligibility Criteria

To guarantee that the review focused solely on the most pertinent studies, we implemented specific eligibility criteria.

Inclusion Criteria

We only considered peer-reviewed journal articles published in English that fulfilled these inclusion requirements:

IC1: Studies must investigate the relationship among job demands, job resources, and key outcomes (e.g., engagement, performance, satisfaction, burnout) within the JD-R framework, emphasizing PsyCap's role in organizational contexts.
IC2: Articles must include quantitative empirical research (e.g., RCTs, cross-sectional, longitudinal studies) to ensure data is robust, measurable, and replicable, excluding non-empirical or conceptual studies.
IC3: Studies must use a validated PsyCap measure (e.g., PCQ) to assess optimism, hope, self-efficacy, and resilience, ensuring consistency and comparability across studies.
IC4: Studies must explicitly examine PsyCap's role as a moderator or mediator in the relationship between job demands, job resources, and employee outcomes.

Exclusion Criteria

EC1: The studies do not directly examine the role of PsyCap as a moderator or mediator within the JD-R theory.
EC2: These articles are not quantitative studies.

EC3: Studies that lack a recognized PsyCap measure or do not clearly assess its four core components (optimism, hope, self-efficacy, and resilience) are excluded.
EC4 : Dissertations, unpublished manuscripts, books, reviews (including meta-analyses), conceptual papers, editorials, commentaries, and conference materials without empirical data are excluded to ensure the inclusion of only peer-reviewed primary studies with validated findings.

Information Sources and Search Strategy

The search was conducted in Web of Science and Scopus, selected for their extensive collections of high-quality, peer-reviewed research across disciplines. Web of Science provides broad coverage of influential journals, while Scopus offers comprehensive abstracts and citations, ensuring access to rigorously vetted literature. Articles published from 2001 to June 30, 2024, were included, as the JD-R model was introduced in 2001 (Demerouti et al., 2001). The search terms used were “psychological capital,” “job demands-resources theory,” and “moderation and mediation.” Details of the search strategy are in Table 1.

Table 1
Search Strings by Database

Database	Search Suggestion	Result
Web of Science	TS= (((“psychological capital” OR “Psycap” OR “positive psychological capital” OR “psychological resources” OR “psychological well-being” OR “mental capital” OR “emotional resources” OR “mental well-being” OR confidence OR “self-efficacy” OR optimism OR hope OR resilience) AND ("JD-R model" OR "JD-R theory" OR "job demands- resources model" OR " job demands- resources theory") AND (moderat* OR mediat*))) and Preprint Citation Index (Exclude – Database) and Article (Document Types) and English (Languages)	300
Scopus	TITLE-ABS-KEY ((("psychological capital" OR "Psycap" OR "positive psychological capital" OR "psychological resources" OR "psychological well-being" OR "mental capital" OR "emotional resources" OR "mental well-being" OR confidence OR "self-efficacy" OR optimism OR hope OR resilience) AND ("JD-R model" OR "JD-R theory" OR "job demands- resources model" OR " job demands- resources theory") AND (moderat* OR mediat*))) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j"))	251

Selection Process

The studies obtained from literature databases were uploaded into Microsoft Excel 2019, where duplicates were identified and removed using the software. Two independent reviewers then screened the titles and abstracts of all retrieved studies according to predefined selection criteria. Full texts of relevant articles were acquired for further evaluation of eligibility. Studies for which the full text could not be accessed via databases or through the authors were excluded from the review. Any discrepancies between the two reviewers during the study selection process were resolved through consultation with a third reviewer to reach a consensus.

Data Collection Process

Following the PRISMA 2020 guidelines (Page et al., 2021) , the systematic review proceeded in four stages. The first stage involved removing duplicate literature. An Excel spreadsheet was used to remove duplicates during the initial screening, based on DOI, as DOI provides a unique and permanent identifier for academic articles. Since not all articles have a DOI, duplicates were also screened based on title. Second, 141 papers were excluded based on inclusion criteria (IC1–IC4) after screening titles, abstracts, and full texts. Third, 201 papers were assessed against exclusion criteria (EC1–EC4), eliminating 166. Finally, the remaining 35 articles underwent a comprehensive review to ensure alignment with the established criteria and research objectives.

Data extraction involved tabulating article characteristics using a standardized form. The final table collected: (i) author(s), year, journal, and country of studied population; (ii) population characteristics (iii) study type and sample size; (iv) measurement of job demands; (v) measurement of job resources; (vi) antecedent(s); (vii) outcome(s); (viii) moderation and mediation effects; (ix) measurement; (x) analysis; (xi) quality assessment; and (xii) quality rating (score).

Risk of Bias (Quality) Assessment

The risk of bias was assessed using two approaches. First, only peer-reviewed articles from verified databases (Section 2.1) were included. Second, all full-text articles underwent quality assessment using Joanna Briggs Institute (JBI) Critical Appraisal Tools, tailored for quantitative studies like RCTs, cohort, and case-control studies (Barker, Stone, Sears, Klugar, Leonardi-Bee, et al., 2023). These customized checklists are more precise than generalized appraisal tools, allowing for a targeted and detailed evaluation of each study's methodological quality.

As this study focused on quantitative research, the JBI tools were particularly well-suited due to their standardized and systematic approach to analysing potential biases across different research designs. The JBI tools also provide a comprehensive framework to assess biases across multiple domains, including methodology, sample selection, data collection, and data analysis, ensuring a thorough and unbiased evaluation of each study's quality. Their inter-rater reliability and construct validity are well established, which is crucial for maintaining consistency across reviews (Barker, Stone, Sears, Klugar, Leonardi-Bee, et al., 2023; Barker, Stone, Sears, Klugar, Tufanaru, et al., 2023; Munn et al., 2014). Reviewers were trained in JBI tool application to ensure uniformity and minimize subjectivity in assessments.

Each article was independently assessed using the JBI critical appraisal checklist specific to its study type. The evaluation covered the title, abstract, introduction, design, sampling, data collection, analysis, results, and discussion. Based on the assessment, articles were categorized as high, medium, or low quality. To minimize errors and subjectivity during data extraction and analysis, the following measures were implemented:

Double Review Process: Two independent reviewers assessed each included study's risk of bias to ensure objective evaluation and minimize personal biases.

Resolution of Discrepancies: Disagreements were resolved through discussion, prompting reviewers to critically re-examine their judgments.

Third-Party Adjudication: If consensus was not reached, a third reviewer made the final decision, ensuring unbiased assessments.

Standardized Data Extraction Forms: A uniform data extraction form ensured consistency in recording key study details.

Reviewer Training: Reviewers were trained in JBI Critical Appraisal Tools to enhance standardization and consistency in quality assessments.

By employing these measures, the study ensured a more rigorous and transparent evaluation of the included articles, minimizing errors and subjectivity throughout the data extraction and analysis process.

Synthesis Methods

The included studies exhibited significant heterogeneity in terms of design, measurement of PsyCap antecedents, and measurement of PsyCap outcomes, making it unsuitable to combine the results for a meta-analysis. Therefore, content analysis was employed to categorize the factors that influence PsyCap.

Results

Study Selection

Following PRISMA 2020 guidelines, database searches (WOS and SCOPUS) yielded 551 records. After removing duplicates, 345 articles were screened, with 141 excluded based on title, abstract, and full-text reviews. Three articles were removed due to unavailable full texts, and 166 were excluded for not meeting eligibility criteria. Ultimately, 35 articles were included, while 516 were excluded.

Exclusion reasons: (1) Not peer-reviewed final publications in English; (2) Did not examine PsyCap's moderating or mediating role in JD-R theory; (3) Did not employ quantitative methods; (4) Lacked a validated PsyCap measure (e.g., PCQ). (See Figure 1 for details.)

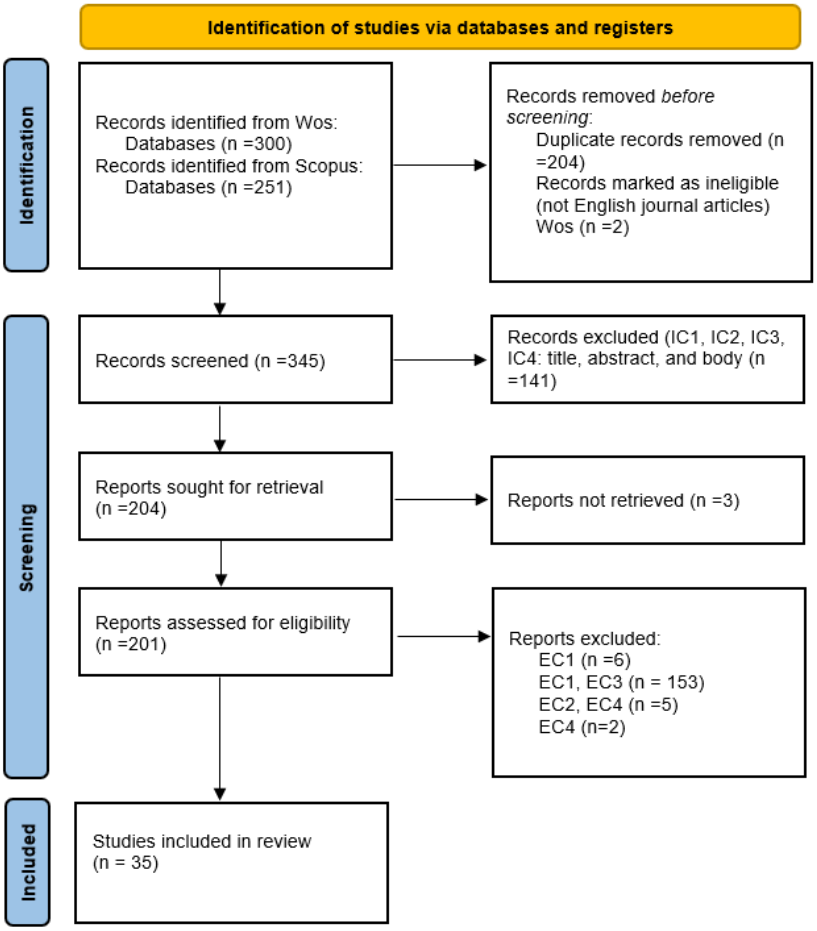

Figure 1. PRISMA 2020 flow diagram

Study Characteristics

As of June 30, 2024, a total of 35 studies met the specified inclusion and exclusion criteria (see Supplementary Data Table 1). Geographically, these studies were primarily concentrated in Asia, with nine conducted in mainland China, four in Taiwan of China, and four in Pakistan, followed by two studies each from Indonesia, India, the Netherlands and Belgium, and Portugal. Additionally, one study was conducted in each of the following countries: Australia, Italy, Germany, the United States, Spain, New Zealand, Malaysia, and Palestine. Two studies did not specify the country in which the data was collected; one was conducted by researchers from China and the United States, while the other was a collaborative effort among scholars from Italy, China, Australia, Spain, and the United Kingdom. This geographic distribution suggests that research on PsyCap has gradually shifted from Western countries to Asian countries in recent years, highlighting the need for future studies to further explore cross-cultural comparisons and examine how different cultural contexts influence PsyCap.

In terms of research design, the included studies comprised 24 cross-sectional studies, 10 longitudinal studies, and one diary study, all of which investigated the mediating or moderating role of PsyCap within the JD-R theoretical framework. These studies spanned a wide range of industries, with education being the most frequently examined sector (eight studies), primarily focusing on university, primary, and secondary school teachers and students. Other sectors included information technology (three studies), hospitality and food services (three studies), healthcare (three studies), nonprofit organizations (two studies),

large-scale retail companies (two studies), social work (one study), public service offices (one study), financial services (one study), aircraft manufacturing (one study), transportation (one study), construction (one study), chain gas stations (one study), coal-mining enterprises (one study), and various businesses (four studies). Additionally, two studies did not specify their industry context.

Although the education sector has received significant attention in PsyCap research, relatively few studies have focused on industries related to environmental protection and sustainable development, agriculture and food production, or electricity and energy. Therefore, future research should aim to explore these underrepresented sectors to enhance the understanding of PsyCap's role across diverse industrial contexts.

Quality Assessment and Risk of Bias

The quality of the 35 selected studies was assessed using the quality assessment tool developed by Barker, Stone, Sears, Klugar, and Leonardi-Bee et al. (2023). Based on the JBI Critical Appraisal Tools, the studies were categorized into three types: cross-sectional, longitudinal, and diary studies. Specifically, 24 cross-sectional studies were evaluated using the JBI cross-sectional study checklist, while 10 longitudinal studies were assessed with the JBI checklist for cohort studies. Additionally, one study met the criteria for evaluation using the JBI quasi-experimental checklist. Among the assessed studies, 24 were rated as "high" quality, while 11 received a "moderate" rating. Areas of elevated risk of bias identified in 31 studies are summarized in Supplementary Data Table 4, 5 and 6.

Of the twenty-four cross-sectional studies, four fully satisfied the criteria outlined in the JBI checklist for analytical cross-sectional studies. Among the remaining twenty studies (see Supplementary Data Table 4), thirteen did not meet the criterion of providing clear sample inclusion criteria, but met the remaining seven criteria (Abukhalifa et al., 2023; Aryani et al., 2021; Chen, 2018; Chen & Peng, 2019; Cheung et al., 2021; Gómez Borges et al., 2023; Grover et al., 2018; Junça Silva et al., 2022; Kataria et al., 2023; Sarwar et al., 2021; Sharma & Tiwari, 2023; Xi et al., 2020; Yao et al., 2022). Two studies failed to provide clear sample inclusion criteria, identify potential confounders, or propose strategies to address them (Viseu et al., 2023; Zhou et al., 2021). Two other studies did not identify potential confounders or propose strategies to manage them ("Unclear") (Adil & Kamal, 2019; Gom et al., 2021). Another two studies lacked clear sample inclusion criteria, did not identify potential confounders, and did not propose strategies to address confounders ("No") (Ashraf et al., 2022; Mazzetti et al., 2016). The final study did not provide clear sample inclusion criteria or propose strategies to manage confounders (Tan et al., 2021) .

An additional 10 studies, evaluated using the JBI checklist for cohort studies, and one study assessed with the JBI checklist for quasi-experimental studies, revealed areas of high risk of bias. These results are presented in Supplementary Data Table 5 and 6, respectively.

Future studies should clearly define sample inclusion and exclusion criteria during the research design phase to enhance reproducibility and result reliability. Greater attention should also be given to identifying and reporting potential confounders, employing appropriate statistical methods such as multivariate regression analysis or propensity score matching to address them. Beyond cross-sectional, longitudinal, and diary studies, future

research should explore experimental designs to better establish causal relationships under controlled conditions.

Results of Individual Studies

Psychological Capital as a Mediator of Individual Studies

Of the 35 studies included in this review, 18 examined PsyCap's mediating role within the JD-R theory framework. Identified job demands included occupational stressors, quantitative overload, work-family conflict, illegitimate tasks, and role demands, while job resources encompassed factors such as perceived organizational support, leadership styles (authentic, supportive, directive, servant, and transformational), autonomy, co-worker support, high-commitment work systems (HCWS), self-care, psychosocial safety climate, and organizational justice.

Wang et al. (2017) found that optimism mildly mediated the relationships between extrinsic effort, reward, and perceived organizational support (POS) with both vigor and dedication. Additionally, PsyCap and hope jointly mediated the links between POS and vigor, dedication, and absorption. Adil and Kamal (2019) identified PsyCap as a mediator between authentic leadership and job outcomes, including work engagement and burnout. Mazzetti et al. (2016) emphasized that PsyCap mediated the impact of job resources, such as autonomy and co-worker support, on work engagement and psychological distress. Yang et al. (2022) found that PsyCap mediated the relationship between supportive supervisory styles (SSS) and graduate students' innovation performance (GSIP).

Chen (2018) highlighted the significant indirect effect of PsyCap on work engagement through HCWS. PsyCap also served as a mediator in the relationship between supportive leadership and nurses' well-being, encompassing aspects of physical well-being, social well-being and psychological well-being (Um-e-Rubbab et al., 2021). According to Niswaty et al. (2021) stated that PsyCap served as a mediator in the link between authentic leadership and employee work engagement. Additionally, self-care was found to have a beneficial impact on academic engagement via PsyCap, and the indirect effect of work-family conflict on occupational well-being through PsyCap was also notably significant (Zhou et al., 2021).

Miao et al. (2024) identified PsyCap as a crucial mediator in the relationship between illegitimate tasks and various outcomes, including volunteer engagement, performance, and turnover intention. Chen and Peng (2019) highlighted PsyCap's mediating role in the positive relationship between branch managers' servant leadership and employees' engagement levels. Zhang et al. (2022) found that safety-related PsyCap mitigated the negative impact of job role demands on psychosocial safety behavior. Similarly, Su et al. (2024) reported that PsyCap mediated the adverse effects of perceived risks on transport performance.

Not all study supported the mediation effect. Gom et al. (2021) found that cross-cultural PsyCap did not mediate the relationship between transformational leadership and turnover intention, nor did it partially mediate the link between psychosocial safety climate and work engagement.

Viseu et al. (2023) reported a partial mediation effect of PsyCap between organizational justice and work engagement. Other studies extended PsyCap's mediating role beyond job

demands and resources, linking it to work engagement, soft skills, and perceived risks. Tan et al. (2021) demonstrated PsyCap's significant mediation between work engagement and meaningful work, while Aryani et al. (2021) found that soft skills positively influenced PsyCap, which in turn enhanced career engagement, with conditional indirect effects of 0.16 for students and 0.14 for employees. Sarwar et al. (2021) reported that PsyCap mediated the relationship between job resources and work-to-family enrichment. Details on the significance, strength, pathways, and mechanisms of these mediation and moderation effects are provided in Supplementary Data Table 2 and 3.

Psychological Capital as a Moderator of Individual Studies

When PsyCap acts as a moderator in the context of the JD-R theory, it can, but is not limited to, mitigate the effects of adverse elements on positive workplace dynamics. More specifically, optimism and self-efficacy had a counterproductive moderation effect on the link between error management climate and job-related stress, while hope and resilience showed expected but statistically insignificant moderation effects (Ashraf et al., 2022). Adil and Kamal (2019) reported that PsyCap buffered the negative impact of quantitative overload on job-related emotional well-being. Chen and Hsieh (2023) confirmed its moderating role in the relationship between high-performance work systems (HPWSs) and workload.

Li et al. (2019) examined job burnout, including emotional exhaustion (EE), depersonalization (DP), and diminished personal accomplishment (PA), and found that PsyCap moderated the impact of teaching-research conflict (TRC) on burnout. Specifically, PsyCap weakened the effects of TRC on EE and DP while enhancing PA. Chen et al. (2018) highlighted that an autonomy-support climate had a stronger effect on work engagement when PsyCap levels were low. Xi et al. (2020) concluded that PsyCap moderated the relationship between social support and work engagement.

PsyCap moderated several nonlinear relationships, including the inverted U-shaped link between work engagement and job performance (Yao et al., 2022). It also influenced the curved relationship between daily time pressure and daily work engagement (Sheng et al., 2019). Additionally, Abukhalifa et al. (2023) found that PsyCap moderated the nonlinear relationship between work engagement and job turnover intentions.

Studies have confirmed PsyCap's role in moderated mediation effects. For example, PsyCap moderated the link between psychological climate and work engagement, strengthening the indirect effect of psychological climate on change-oriented organizational citizenship behaviours (Ch-OCBs) via work engagement (Kataria et al., 2023). Similarly, PsyCap enhanced the indirect effect of social and organizational resources on satisfaction through engagement, with stronger effects among individuals with higher PsyCap (Junça Silva et al.,2022). Sharma and Tiwari (2023) found that PsyCap moderated the indirect impact of techno-stress on work-life balance via burnout, with a stronger negative effect at lower PsyCap levels. Ilies et al. (2024) highlighted that PsyCap influenced the indirect effect of utilizing personal strengths on work engagement through inspiration, with a significant positive effect at lower PsyCap levels but a non-significant effect at higher levels.

Several studies confirm PsyCap's moderating role in certain variables and groups, though not universally. Cheung et al. (2021) found that PsyCap moderated the relationship between

social support and work engagement but had no effect on the link between work autonomy and work engagement. Similarly, Vanderstukken and Caniëls (2021) observed that PsyCap moderated the impact of low autonomy on subordinates' feelings of alienation but not on supervisors. Ilies et al. (2024) validated PsyCap's moderated mediation effect and its role in linking personal strengths utilization to inspiration, though it did not affect the relationship between personal strengths usage and meaningfulness.

The moderating role of PsyCap was not consistently supported. Kuhlmann and Süß (2024) found that PsyCap did not moderate the effects of job demands on burnout. Similarly, Grover et al. (2018) reported that PsyCap neither moderated the relationship between job demands and well-being nor influenced the effect of job resources on employee engagement, with both pathways being statistically insignificant. Van Steenbergen et al. (2018) reported that PsyCap neither moderated the relationship between job demands and well-being nor influenced the effect of job resources on employee engagement, with both pathways being statistically insignificant.

Results of Syntheses

Measure Syntheses

The selected studies used different PsyCap questionnaires, leading to significant heterogeneity. This variation in measurement tools made meta-analysis impractical, necessitating a narrative synthesis to account for the diversity in PsyCap assessments. The differences in PsyCap scales notably influenced the findings.

Seventeen studies used the 24-item Psychological Capital Questionnaire (PCQ) (Luthans, 2006; Luthans et al., 2007; Mahon et al., 2014), offering a comprehensive assessment of PsyCap's four core dimensions: optimism, hope, self-efficacy, and resilience. It remains the most thorough measure. In contrast, twelve studies employed the shorter 12-item PCQ (Avey et al., 2011; Luthans, 2015; Luthans et al., 2007), and the four-item version. Additionally, the five-item PsyCap scale used by Miao et al. (2024) and developed by Szerdahelyi et al. (2022), provided a highly concise measure, but its brevity may limit its ability to fully capture the multidimensional nature of PsyCap. Similarly, the four-item PsyCap Scale (PC) used by Su et al. (2024), provided a quick assessment but likely lacked the granularity needed to explore PsyCap's complex role as a mediator or moderator in the JD-R theory (Bergheim et al., 2015; Luthans, 2006; Luthans, 2015).

Another key variation was the use of Cross-Cultural PsyCap in Gom et al. (2021), based on Luthans' original construct. This 20-item scale (Dollwet & Reichard, 2014) adapted PsyCap for cross-cultural contexts, making it particularly relevant for global organizations. While highly reliable (Cronbach's $\alpha = 0.94$), its emphasis on adaptability may shift the focus from workplace challenges central to the JD-R theory. Similarly, Zhang et al. (2022) expanded PsyCap to assess safety-related PsyCap among Chinese coal miners, incorporating safety self-efficacy, self-regulation, and calmness. Though highly reliable (Cronbach's $\alpha = 0.961$), its industry-specific nature limits comparability with broader PsyCap studies. The Compound PsyCap Scale (CPC-12) developed by Lorenz et al. (2016) and used by Viseu et al. (2023) provides a validated, shorter alternative (Cronbach's $\alpha > 0.70$), balancing efficiency with reduced depth, but may still lack the depth of the full 24-item PCQ. In contrast, the 13-item

PCQ used by Yang et al. (2022) lacks clear validation, raising concerns about its reliability and comparability.

Psychological Capital as a Mediator Synthesis

PsyCap has frequently been examined as a mediating variable within the JD-R theory. Of the 35 studies reviewed, 18 explored its mediating role, highlighting its widespread influence. PsyCap was found to mediate relationships between various job demands (e.g., occupational stressors, work-family conflict) and job resources (e.g., perceived organizational support, autonomy), though the strength and direction of this effect varied. Optimism showed a weak, partial mediating effect in some cases (Gom et al., 2021; Viseu et al., 2023; Wang et al., 2017), while other studies reported a strong mediating effect (Adil & Kamal, 2019; Chen, 2018; Chen & Peng, 2021; Mazzetti et al., 2016; Miao et al., 2024; Niswaty et al., 2021; Yang et al., 2022; Zhang et al., 2022). Most studies confirmed the statistical significance of PsyCap's mediating role based on confidence intervals and p-values, though findings varied. One study rejected its mediating role (Gom et al., 2021), while another only partially supported it (Viseu et al., 2023). Group differences also influenced PsyCap's mediation, as Aryani et al. (2021) found PsyCap bridged the relationship between soft skills and career engagement across age groups.

Beyond job demands and resources, PsyCap also mediated relationships between meaningful work, soft skills, and work engagement. Its mediating effect aligned with JD-R theory outcomes, particularly in work engagement (Adil & Kamal, 2019; Chen, 2018; Chen & Peng, 2021; Mazzetti et al., 2016; Miao et al., 2024; Niswaty et al., 2021; Viseu et al., 2023; Wang et al., 2017), performance (Adil & Kamal, 2019; Chen & Peng, 2021; Miao et al., 2024; Su et al., 2024; Yang et al., 2022), well-being (Adil & Kamal, 2019; Um-e-Rubbab et al., 2021; Zhou et al., 2021), turnover intention (Gom et al., 2021; Miao et al., 2024), burnout (Adil & Kamal, 2019; Miao et al., 2024), psychological distress (Mazzetti et al., 2016), meaningful work (Tan et al., 2021), psychological safety behaviour (Zhang et al., 2022), affective commitment (Viseu et al., 2023), and balance satisfaction (Sarwar et al., 2021).

To sum up, PsyCap often serves as a crucial mediating factor in the JD-R framework. However, the strength, direction, and statistical significance of its mediating effect can vary between studies. Additionally, cultural and group differences may influence the mediating role of PsyCap.

Psychological Capital as a Moderator Synthesis

Among the 17 studies examining PsyCap as a moderator, job demands included quantitative overload, teaching–research conflict, risk perception, time pressure, and techno-stress, while job resources encompassed error management climate, authentic leadership, HPWSs, social support, work autonomy, unit leaders' autonomy-support climate, psychological climate, and both social and organizational resources. In addition to job demands and resources as antecedents, work engagement, NWW, and personal strengths also played key roles. Outcomes included job stress, work engagement, job-related affective well-being, burnout, in-role performance, psychological well-being, workload, emotional demands, safety-specific transformational leadership, service performance, Ch-OCBs, job performance, academic engagement, student satisfaction, work alienation, turnover intention, work-life balance (WLB), work-family interpersonal capitalization, and positive work reflection.

Most studies support PsyCap's moderating role within the JD-R theory, though findings are inconsistent. Three studies found no evidence of this effect (Grover et al., 2018; Kuhlmann & Süß, 2024; Van Steenbergen et al., 2018). Four studies reported partial moderation, with PsyCap influencing certain variables or specific groups but not others (Ashraf et al., 2022; Cheung et al., 2021; Ilies et al., 2024; Vanderstukken & Caniëls, 2021).

Some studies confirm PsyCap's moderated mediation effect (Ilies et al., 2024; Junça Silva et al., 2022; Kataria et al., 2023; Sharma & Tiwari, 2023), indicating that PsyCap's moderated mediation effect of mediation varies with different levels of the moderating variable. This framework helps explain how indirect effects shift under varying conditions. Research also suggests PsyCap can act as a negative moderator, mitigating the impact of adverse factors on positive work outcomes. For instance, Adil and Kamal (2019) found that PsyCap buffered the negative effects of excessive quantitative demands on emotional well-being and job performance. Additionally, five other studies confirmed PsyCap's negative moderating influence across various workplace settings (Ashraf et al., 2022; Chen & Hsieh, 2023; Cheung et al., 2021; Li et al., 2019; Vanderstukken & Caniëls, 2021).

Research suggests that PsyCap serves as a positive moderator, strengthening the relationship between specific variables. For example, Chen and Hsieh (2023) found that PsyCap moderated the link between high-performance work systems and workload. Six other studies also confirmed PsyCap's role in enhancing the positive effects of independent variables on dependent variables (Ilies et al., 2024; Junça Silva et al., 2022; Kataria et al., 2023; Li et al., 2019; Sharma & Tiwari, 2023; Xi et al., 2020). In summary, PsyCap as a moderating factor displayed both diversity and complexity across different studies. It can either buffer negative effects or enhance positive effects, though these outcomes are not consistently confirmed and may vary depending on the groups and variables involved.

Discussion

Summary of Evidence

This systematic review examines PsyCap's dual role as both a moderator and mediator within the JD-R framework, drawing on evidence from 35 studies. While previous research has largely overlooked a systematic analysis of these roles, this review provides a comprehensive evaluation. The JD-R theory (Bakker & Demerouti, 2007, 2014) is widely applied across various sectors, and understanding PsyCap as a personal resource can help employees navigate workplace challenges more effectively (Da et al., 2021). PsyCap enhances work engagement, contributing to higher job satisfaction and employee retention (Adil & Kamal, 2019; Zyberaj et al., 2022).

Research shows that PsyCap mediates various relationships within the JD-R theory, with its four components—optimism, hope, self-efficacy, and resilience—significantly impacting work engagement, performance, well-being, and turnover intentions. However, the strength and direction of these mediating effects vary. For example, Wang et al. (2017) found optimism had only a weak mediating effect, while Gom et al. (2021) didn't support the mediating role. In contrast, other studies reported strong effects. These differences may stem from research context, sample characteristics, and assessment methods. While this review confirms PsyCap's mediating role in job demands, job resources, and work outcomes, factors such as

organizational culture and leadership style could influence its impact. Future research should explore how these moderating variables interact with PsyCap to shape work outcomes.

PsyCap acts as a buffer, mitigating the negative impact of workplace stressors on employee well-being. However, some studies have not supported its moderating role. For example, Grover et al. (2018), Kuhlmann and Süß (2024), and Van Steenbergen et al. (2018) found no evidence that PsyCap influenced the relationship between job demands and burnout or between job resources and engagement. This inconsistency suggests that certain influencing factors may be overlooked. The moderating effect of PsyCap may depend on cultural and individual differences, such as personality, professional experience, and career stage, as well as organizational factors like structure and HR policies.

The findings of this review align with the JD-R theory, which suggests that job resources alleviate the negative impact of job demands on employee outcomes. As a key personal resource, PsyCap—comprising hope, efficacy, resilience, and optimism—enhances this relationship. Prior research highlights the role of personal resources in strengthening employee resilience and performance (Xanthopoulou et al., 2007). This review expands on that by confirming PsyCap's dual role as a mediator and moderator, underscoring its complex influence within the JD-R framework. However, some studies did not support its moderating role (Grover et al., 2018; Kuhlmann & Süß, 2024; Van Steenbergen et al., 2018), and even concluded that PsyCap is not a coping mechanism and therefore argued that it should not be classified as a personal resource within this key model (Xanthopoulou et al., 2007). Despite these discrepancies, most research affirms PsyCap's moderating role, reinforcing its recognition as a core personal resource in the JD-R theory. The variability in findings, particularly regarding PsyCap's moderating role, supports previous research suggesting that the effectiveness of personal resources is context-dependent (Bakker & Demerouti, 2017). This study underscores PsyCap as a crucial link between job characteristics and work outcomes, aligning with Schaufeli & Taris (2014). Incorporating PsyCap into the JD-R model offers a deeper understanding of the complex interactions among job characteristics, personal resources, and health outcomes.

Limitations

Although this review offers a thorough analysis of the existing literature, it does have some limitations. First, the heterogeneity in study selection limits the feasibility of conducting a meta-analysis, as different studies employed varying PsyCap measurement tools. Additionally, the internal consistency, indicated by Cronbach's alpha coefficients, showed considerable variation among the studies. Furthermore, limiting the search to studies that are "published in English," "peer-reviewed," and found in "academic journals" may have meant overlooking some significant research. Moreover, the variation in sample diversity and cultural backgrounds could impact how broadly the findings can be applied. Moreover, differences in study design, such as cross-sectional versus longitudinal studies also affect the generalizability of findings.

Implications for Research and Practice

Future studies ought to prioritize the creation and application of a standardized tool for measuring PsyCap, which would improve the comparability of findings (Luthans et al., 2006). While various PsyCap measurement methods are widely utilized, inconsistencies in

operational definitions and measurement scales hinder the generalizability of findings (Newman et al., 2014). Establishing standardized measures would enhance the reliability of comparative analyses and meta-analytic studies.

Furthermore, there should be an increased focus on how cultural variations affect the function of PsyCap, especially in a globalized environment. Previous research has indicated that the role of PsyCap may vary across cultural contexts due to differences in work values, leadership styles, and organizational structures (Dollwet &Reichard, 2014). Future research should examine how cultural factors shape the impact of PsyCap within the JD-R framework.

Additionally, future research should implement more robust designs, such as experimental or longitudinal studies, to better elucidate the mediating and moderating mechanisms of PsyCap. While previous studies have relied primarily on cross-sectional data (Xanthopoulou et al., 2007; Avey et al., 2011), longitudinal designs will provide deeper insights into the temporal dynamics of PsyCap and its impact on job demands, resources, and employee outcomes. Experimental studies can further validate causal relationships and inform the development of targeted interventions.

Researchers should also investigate the applicability of PsyCap across industries and occupational groups. While PsyCap has been extensively studied in corporate settings, its role in high-demand occupations such as healthcare, education, and public administration warrants further exploration (Bakker & Demerouti, 2017). Understanding how PsyCap functions in different work settings will provide insights into its adaptability and effectiveness as a workplace intervention strategy.

Future research should further explore the dual role of PsyCap in the JD-R framework. As a mediator, PsyCap explains how job resources improve engagement, satisfaction, and performance, highlighting the need for interventions to enhance self-efficacy, hope, optimism, and resilience (Xanthopoulou et al., 2007; Avey et al., 2010). Research should explore how PsyCap-based training can optimize resource utilization and improve workplace outcomes.

As a moderator, PsyCap buffers the negative effects of job demands and reduces burnout and psychological distress in high-pressure environments (Bakker et al., 2023; Luthans et al., 2015). Future research should examine strategies such as coaching and mentoring to enhance the protective effects of PsyCap, especially in demanding occupations (Galanakis & Tsitouri, 2022).

For professionals and leaders within organizations, these results highlight the importance of nurturing and developing PsyCap among staff. Organizations can leverage the insights from this review to design and implement effective interventions aimed at enhancing employees' PsyCap levels. For instance, employee training and development initiatives can effectively enhance optimism, hope, self-efficacy, and resilience among staff members. By equipping employees with skills to manage job-related challenges and maximize the resources at their disposal, these programs can significantly elevate overall well-being and performance.

Furthermore, organizational strategies should prioritize fostering positive employee development by tailoring job resources to individual needs, such as offering greater autonomy, support, and feedback, while effectively managing job demands to enhance employee well-being and performance. In high-pressure settings, it is essential for organizations to introduce strategies that specifically enhance the protective function of PsyCap, emphasizing its ability to mitigate the impact of job demands. This may include resilience training, stress management workshops, or mentoring programs aimed at reinforcing psychological strengths. By considering the distinct roles of PsyCap as both a mediator and moderator, organizations can tailor their interventions to different work contexts, ultimately enhancing employee well-being and organizational performance.

Supplementary Data

The supplementary data tables referenced in the manuscript are available at DOI: 10.6084/m9.figshare.28536833 (https://doi.org/10.6084/m9.figshare.28536833)

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